

Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the [interactive fault map](#).

Cottonwood Basin fault (Class A) No. 1020

Last Review Date: 1998-03-05

Compiled in cooperation with the Arizona Geological Survey

citation for this record: Pearthree, P.A., compiler, 1998, Fault number 1020, Cottonwood Basin fault, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, <https://earthquakes.usgs.gov/hazards/qfaults>, accessed 12/14/2020 02:21 PM.

Synopsis

The Cottonwood Basin fault is a fairly minor fault located in the Verde Valley in the Central Highlands portion of the Basin and Range province. It is on the northwest side of the southernmost Verde Valley, opposite the Verde fault zone [948] (a major structural element of the region). Most of the displacement on the Verde fault zone and subsidence of the Verde Valley occurred during the late Miocene and Pliocene (Bressler and Butler, 1978 #2108; Nations and others, 1981 #2110). The Cottonwood Basin fault displaces Tertiary volcanic rocks. Lower Pleistocene terrace deposits are displaced several meters vertically. Faulting is expressed as low, subdued, southwest-facing scarps on Tertiary volcanic rocks and on an early Pleistocene terrace remnant.

	Middle to late Pleistocene alluvial fans may be faulted by a small amount as well, but there are no clear alluvial scarps formed on these surfaces.
Name comments	Part of the fault was mapped by Twenter and Metzger (1963 #2111); detailed surficial geology was mapped by House (1994 #2109). The name Cottonwood Basin fault is applied herein. Fault ID: The Structure Number 1020 was originally assigned to the Meers fault, Oklahoma in the compilation of Crone and Wheeler (2000 #4359), but the Meers fault is now assigned Structure Number 1031 in the database.
County(s) and State(s)	YAVAPAI COUNTY, ARIZONA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. <i>Comments:</i> Trace based on 1:24,000-scale mapping by House (1994 #2109), transferred to 1:250,000-scale topographic map.
Geologic setting	The Cottonwood Basin fault is located in the Verde Valley in the Central Highlands portion of the Basin and Range province. The Cottonwood Basin fault is a fairly minor fault on the northwest side of the southernmost Verde Valley, a large, asymmetric, southwest-tilted graben. Most of the displacement on the Verde fault [948] and subsidence of Verde Valley occurred during the late Miocene and Pliocene (Bressler and Butler, 1978 #2108; Nations and others, 1981 #2110) as recorded by displacement of Tertiary volcanic rocks and accumulation of the Verde Formation sediments in Verde Valley. During most of that time, the Verde Valley was a closed, undissected basin. During the Quaternary, the Verde River downcut substantially and the Verde Valley has undergone dramatic dissection, leaving suites of dissected fan and terrace remnants ranging from late Pliocene/early Pleistocene to early Holocene in age (House, 1994 #2109).
Length (km)	5 km.
Average strike	N43°W
Sense of	Normal

movement	<i>Comments:</i> Inferred from topography and regional relations.
Dip Direction	SW
Paleoseismology studies	
Geomorphic expression	Faulting is expressed as low, subdued, southwest-facing scarps on Tertiary volcanic rocks and on an early Pleistocene terrace remnant. Middle to late Pleistocene alluvial fans may be faulted a small amount, but there are no clear alluvial scarps formed on these surfaces.
Age of faulted surficial deposits	Early Pleistocene, middle to late Pleistocene(?) Age estimates are based on examination of soil characteristics, the position of alluvial surfaces in the landscape, and regional correlations.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) <i>Comments:</i> This estimate is based on displacement of lower Pleistocene terrace deposits and possible displacement of middle to upper Pleistocene alluvial-fan deposits.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> A low slip rate is inferred based on 2-3 m of vertical displacement of deposits estimated to be about 1 Ma.
Date and Compiler(s)	1998 Philip A. Pearthree, Arizona Geological Survey
References	#2108 Bressler, S.L., and Butler, R.B., 1978, Magnetostratigraphy of the late Tertiary Verde Formation, central Arizona: Earth and Planetary Science Letters, v. 38, no. 2, p. 319-330. #4359 Crone, A.J., and Wheeler, R.L., 2000, Data for Quaternary faults, liquefaction features, and possible tectonic features in the Central and Eastern United States, east of the Rocky Mountain front: U.S. Geological Survey Open-File Report 00-260, 332 p.

#2109 House, P.K., 1994, Surficial geology of the southern Verde Valley, Yavapai County, Arizona: U.S. Geological Survey Open-File Report 94-23, 20 p., 3 sheets, scale 1:24,000.

#2110 Nations, J.D., Hevly, R.H., Landye, J.J., and Blinn, D.W., 1981, Paleontology, paleoecology, and depositional history of the Miocene-Pliocene Verde Formation, Yavapai County, Arizona: Arizona Geological Society Digest 13, p. 133-150.

#2111 Twenter, F.R., and Metzger, D.G., 1963, Geology and ground water in Verde Valley—The Mogollon Rim region, Arizona: U.S. Geological Survey Bulletin 1177, 132 p., scale 1:62,500.

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